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METERING STORING UNIT

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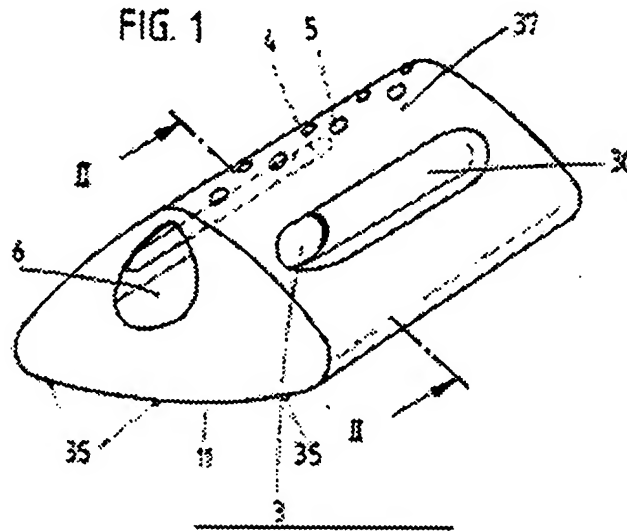
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The invention concerns a metering storage unit (1) to hold and release a clothing-treatment liquid in a washing machine with openings (3, 4, 5, 6) for the discharge of the clothing-treatment agent. To attain an increased usage value, the invention proposes that the metering storage unit (1)

be designed as an axial rib, which can be inserted into the washing drum (7), with a length corresponding approximately to the depth of the washing drum (7).



The invention concerns a metering storage unit according to the features of the preamble of Claim 1.

Metering storage units to hold and release a clothing-treatment agent in a washing machine have already become known in various designs. Metering storage units which are always open have, for example, in their upper area, one or a number of filling openings, through which the clothing-treatment liquid can be poured into the metering storage unit. Such a metering storage unit is then placed in the washing machine filled with clothes. After the beginning of the washing process, the clothing-treatment liquid flows out into the washing liquor due to the drum movement in the rotating washing drum and the drum movement of the metering storage unit caused thereby, if it is a previously poured-in liquid detergent or the dissolved and diluted clothing-treatment agent, such as a dry powder or washing paste. The firm anchoring of a metering storage unit in the washing drum has, moreover, already become known (see U.S. Patent No. 3,095,722), in that the metering storage unit rotates with the washing drum. With this known metering storage unit, the clothing-treatment liquid will discharge only during a certain operating cycle of the washing machine, following the spin cycle. The metering storage unit is therefore suspended in an articulated manner, so that as a result of its force of gravity in the rotating drum, it is always suspended vertically or is aligned in accordance with the centrifugal force. In order to avoid impairment by the clothes, the metering storage unit is also covered by a covering cap.

This known, last-described system is relatively expensive. Moreover, occasionally it is also desired that the clothing-treatment agent be added immediately at the beginning of the washing

cycle. However, a dispensing of clothing-treatment liquid or softened or dissolved clothing-treatment agent from the metering storage unit should not appear, if possible, before the beginning of the washing cycle.

The problem of the invention, therefore, is to develop and further refine the known metering storage unit in such a way that an increased usage value is produced in a manufacturing simplification.

This problem is solved with a metering storage unit with the features of Claim 1.

The metering storage unit, in accordance with the invention, is inserted, as an additional rib, into the washing drum of a washing machine. An improved washing effect results and, at the same time, a metering storage unit is firmly anchored in the washing machine drum. The length of the metering storage unit corresponds approximately to the depth of the washing drum. Furthermore, the metering storage unit can have not only an opening or openings for pouring in and discharging the clothing-treatment agent, but rather (perhaps additionally), entry and exit openings, which have a throughflow of washing liquid, of washing liquor, during the washing process. Since the metering storage unit can be anchored firmly in the washing machine drum, but is detachable, i.e., removable, for example, for filling, a flow of the washing liquor opposite the rotating movement of the metering storage unit is produced during the rotation of the drum. The washing liquor can enter into the metering storage unit through openings formed on opposite surfaces of the metering storage unit, and can subsequently exit. This ensures that the clothing-treatment agent is completely and rapidly released into the washing liquid. Moreover, the size of the holes can also influence the time delay with which the clothing-treatment agent blends into the washing liquor after the beginning of a washing process. In accordance with the invention, a metering storage unit is created with an additional function, as it were. It makes possible not only the metering addition of the clothing-treatment agent into the washing liquid during a washing process, but rather by the firm anchorage in the washing machine drum, it also offers an additional flow hindrance and thus a rolling effect, as is produced by known ribs of the washing machine. The fact that the metering storage unit is filled with the clothing-treatment agent or, during the course of the washing cycle, increasingly, with a liquor decreasing in concentration, and has the aforementioned openings formed in the side walls, this liquor flows into the overhead position of the washing machine drum from above onto the clothes and thus produces an additional special washing effect. As a result of the anchorage of the metering storage unit in the washing drum, it is practically impossible for the clothing-treatment liquid to exit before the beginning of the washing cycle (no losses in the liquor sump); on the other hand, however, bothersome knocking noises, which appear with loose metering storage units, during the operation of the washing machine, are avoided. According to an advantageous refinement, provision is made so that the openings are arranged staggered with respect to one another, with this measure also being advantageous for a good throughflow and washing out of the

metering storage unit. The openings can be staggered with respect to one another, both vertically and laterally. It is preferable that the openings be constructed in such side walls of the metering storage unit, that (in the installed state of the metering storage unit) point in the circumferential direction of the washing drum. Furthermore, it is particularly preferred that in the area of the openings, a recessed grip, serving more or less as a scoop groove also, be constructed. The openings are preferably constructed in the interior of the wall area of the recessed grip included in the metering storage unit. With a rotation of the washing machine drum and a corresponding immersion and surfacing of the metering storage unit affixed firmly in the drum, water is scooped along in the recessed grip or the scoop groove, which water in the groove lying above, during the movement into the overhead position, also runs into the interior of the metering storage unit through the opening formed in the recessed grip or the scoop groove. In this way, a certain after-rinsing effect can be attained. For this purpose, the grooves are also preferably formed in a longitudinal section with a slope to the opening. It is also preferable for a recessed grip to project, in the transverse section, beyond the rear grip area and for a hollow to be formed for the holding or intermediate storage of detergent. With this design, the liquid clothing-treatment agent can be poured onto the metering storage unit from above, for example, striking the rear grip area wherein the clothing-treatment agent then runs over the rear grip area, into the recessed grips preferably formed on both sides, and flows through the openings into the interior of the metering storage unit. The hollow (with reference to the usual setup of the metering storage unit during the filling) takes up the detergent, which is flowing in surge-like and can then run off through the openings into the recessed grooves into the interior of the metering storage unit. In the same way, these hollows also take up washing liquor when immersed the liquor during the washing operation, which can then subsequently flow into the interior of the metering storage unit, in a delayed manner, after surfacing [of the hollows] from the washing liquor. With regard to the shape of the metering storage unit, provision is also preferably made so that the opposite surfaces enclose, in a cross section, an obtuse angle. The angle can, for example, be up to  $120^\circ$ . As a result of the relatively large angle, a relatively large volume for the clothing-treatment agent is produced in the interior of the metering storage unit. At the same time, a relatively large base area is produced, which can be used for the anchorage or the adherence of the metering storage unit in the washing machine drum. Moreover, in accordance with an advantageous development, provision is made so that one or more openings are also constructed in a cover of the metering storage unit, pointing radially inwards to the washing drum. During the washing process and the related rotational movement of the drum, washing liquid flows into the metering storage unit, which, while flowing through the upper semicircle, can flow from the cover of the metering storage unit also, with an accumulation of clothing-treatment agent, at least at the beginning. In this way, the washing effect is advantageously supported. The filling of the metering storage unit with the washing treatment agent can be undertaken in different ways. For example, it is conceivable that the

clothing-treatment liquid can be poured in by means of a funnel or the like into the lateral or upper openings. Within the framework of the invention, the design is also provided wherein the metering dosage unit also has, for the purpose, a front opening facing the user. This can be closed by means of a clip closure or a screw-top. The removal opening is advantageously constructed at a distance from the metering storage unit base, wherein, the throughflow openings are also advantageously located in the side walls at a distance from the base. When the washing machine is standing still while the metering storage unit is being filled with a clothing-treatment agent, it cannot yet appear from the metering storage unit if the filling has not gone over the level of the openings in the side walls; on the other hand, the clothing-treatment agent is added--metered--into the washing liquor, immediately with the beginning of the clothing treatment cycle. Moreover, it is advantageous that the plane of the filling opening, particularly if it is always open, runs in an inclined manner. This can advantageously support the effect of the inflow of washing liquor into the metering storage unit. Also, the clothing-treatment agent can also exit during the washing cycle from this opening. Moreover, an advantageous scooping effect results. The filling opening can be expanded funnel-like toward the metering storage unit base. In its entire structure, the metering storage unit, as already stated, is advantageously constructed rib-like, which should mean that upon fastening in the washing drum, a rib of the washing drum, so-to-speak, is formed. In this way also, there is an advantageous influencing of the washing process. In addition to the aforementioned additional rolling effect, there is also a trickling effect from above, but not merely with washing liquor, but rather, within the framework of the washing cycle, with increasingly dilute clothing-treatment agent. It is appropriate for the length of the metering storage unit to correspond approximately to the depth of the washing drum. A special importance is also found in constructing the metering storage unit, in cross section, with an oval shape. In particular, in combination with a soft-elastic, resilient plastic, for the attaining of a pumping effect in interaction with a washing pressure. Such a body, which can be designated also as a hose-like, oval metering storage unit, can accelerate the dissolution or dilution of detergent by a pumping effect. The design of the metering storage unit can also be selected in such a way that the wall of the metering storage unit facing the washing machine interior is constructed in cross section in a wavy manner converging at an acute angle with the storage unit base, which is preferably constructed adapted, in rounded form, to the washing drum. The "wave feet," on both sides, form, as it were, a scooping ladle, which takes up and carries along a large amount of washing liquor when the metering storage unit surfaces from the washing liquor, which then flows in through the openings into the interior of the metering storage unit or can trickle onto the clothes from above. The affixing of the metering storage unit in the washing drum can be implemented in different ways. It is preferred that in the storage unit base of the metering storage unit, magnetic elements be introduced directly into the plastic, that is, be present in encapsulated form. Since over 90% of the known washing machines have ferromagnetically magnetizable

washing drums, it is possible to anchor such a metering storage unit in the washing drum by magnetic force, without additional aids. Provision can also be made so that the magnetic elements are constructed projecting into the interior of the metering storage unit, and also hereby in a form covered with plastic. The magnetic elements simultaneously form flow hindrances or baffle plates on the base of the metering storage unit, which can provide for a complete thorough flooding and flushing out of the metering storage unit. All total, there is a nonproblematic removal and fixing of the metering device with magnetic elements in the base. Moreover, the fastening of the metering storage unit can also be implemented by means of a holder band, which can latch into openings of the washing drum. This can advantageously be an elastic band. Moreover, outside latching nubs for insertion anchoring into the openings of the washing drum can be constructed on the metering storage unit base. In another design, provision is made with respect to the fastening so that by means of a holder band, which is constructed so as to be adhesive, preferably on the underside facing the washing drum, the metering storage unit can be inserted into the washing drum in an adhesive-binding manner by means of this holder band. The adhesive binding is preferably released by a Velcro fastening. To this end, the metering drum has a fleece band on the bottom side and the holder band, a Velcro surface, on the upper side. With regard to the adhesive--lower--side of the holder band, such a Velcro means can be used, which practically always anchors the holder band in the washing machine drum, in which the adhesive effect is not even impaired by the temperature rising during the washing cycle. As an alternative to the Velcro fastening, provision can also be made so that magnetically effective metal elements are located in the holder band or the holder, in general, and that other magnetically effective metal elements are located in the base of the metering storage unit. This is preferred for those washing machine drums which, as exceptional cases, are constructed ferromagnetically nonresponsive. With respect to the magnetic elements, moreover, it may be advantageous with metering storage units for magnetic and nonmagnetic washing machine drums to provide an elongated structure for them. The metering storage unit can be inserted into the washing machine drum through a simple magnetic closure and be again removed from it. The aforementioned fastening possibilities can also be expanded by combination, with simple insertion elements that engage with the openings of the washing machine drum. In particular, such insertion elements can be combined with the magnetic holder of the metering storage unit. They prevent a lateral shift. It is significant that on the basis of the rotational movement of the drums, centrifugal forces appear, which impinge on the metering storage units, in any case, toward the outside of the drum. Moreover, it is possible to have interacting pressure elements located in the holder band and in the base of the metering storage unit. The accepting part and also the insertion part can be located in the holder band and also in the metering storage base. It is preferred, however, that the insertion part be located in the metering storage base. With a removed metering storage unit and washing without the metering storage unit, there is no damage to the clothing because of projecting insertion

elements. The accepting parts can be constructed laterally with a middle acceptance opening. In another alternative design, it is possible to construct interacting track elements in the holder band and the base of the metering storage unit. It is preferable that they be constructed in such a manner that the metering storage unit can be pushed onto the holder band by means of elements constructed correspondingly for the purpose. Deviating from this, plastic tracks or, perhaps also, a plastic framework suitable for holding can be affixed directly in the washing drum, without an intermediate layer of the adhesive band. Furthermore, it is particularly important that the metering storage unit base be constructed rounded, with such a curvature that it is adapted to the curvature of the washing machine drum, in the opposite sense. Thus, an optimal fit in the washing machine drum is made possible. [Sentence is repeated in German.] The described designs and fastening possibilities for the metering storage unit refer equally to front-loading as well as top-loading washing machines.

The invention is explained in more detail below, with the aid of the appended drawings, which, however, merely represent embodiment examples. Shown are:

Figure 1, a perspective view of a first embodiment of the metering storage unit;

Figure 2, the metering storage unit, according to Figure 1, cut along line II-II;

Figure 3, a perspective view of a second embodiment of the metering storage unit, with an oval cross section;

Figure 4, the metering storage unit, according to Figure 3, cut along line IV-IV;

Figure 5, a perspective view of a third embodiment of the metering storage unit;

Figure 6, the section of the metering storage unit according to Figure 5, cut along line VI-VI;

Figure 7, a perspective view of a fourth embodiment of the metering storage unit;

Figure 8, the metering storage unit according to Figure 7, cut along line VIII-VIII;

Figure 9, a perspective view of a fifth embodiment of the metering storage unit;

Figure 10, the metering storage unit according to Figure 9, when affixed in the washing machine drum;

Figure 11, a side view of a sixth embodiment of a metering storage unit, in accordance with the invention;

Figure 12, a section through the metering storage unit according to Figure 9, along line XI-XI;

Figure 13, a representation according to Figure 12, but only of the lower area of the metering storage unit, when inserted into the washing drum;

Figure 14, a perspective representation of a washing machine with installed metering storage unit according to Figure 1;

Figure 15, a cross section through a metering storage unit, which is held by means of an adhesive tape in the washing machine drum;



Figure 16, a perspective view of a holder possibility by means of snap fasteners;

Figure 17, a perspective view of a holder possibility by means of track elements; and

Figure 18, a cutaway cross-sectional representation through a metering storage unit held in the washing machine drum.

A metering storage unit 1 is shown and described, see for example Figure 1, which is used to hold and release a clothing-treatment liquid in a washing machine 2. The metering storage unit 1 has openings 3, 4, 5, and 6, which, as will be described in detail below, are used to fill and release the clothing-treatment agent and for the passage of the washing liquor. In such a metering storage unit, both liquid detergent and also a washing paste or powder detergent can be poured in as a clothing-treatment agent. The metering storage unit 1 is affixed in a washing machine drum 7, so that it circulates with the drum during the washing process. The openings 3 and 4 are made on opposite surfaces 8 and 9 of the metering storage unit 1. By the rotation of the washing drum 7, the washing liquid flows, for example, through the openings 3, into the interior of the metering storage unit 1 and then exits through the openings 4. The side walls 8 and 9 point in the circumferential direction of the washing drum, when the metering storage unit 1 has been installed.

As can be seen, in particular, from Figure 2, the opposite surfaces 8 and 9, in cross section, enclose an angle alpha, which is larger than a right angle. Moreover, in the area of openings 3, 4, a recessed grip 30, serving as a scoop groove, is formed. Whereas the recessed grips 30 can be shaped in the two side walls 9 and 8, geometrically uniform, symmetrical with respect to one another, the openings 3, 4 are arranged staggered in these recessed grips. The recessed grips 30 are also preferably located, with respect to height, in the upper half of the metering storage unit 1. On the one hand, they are favorably placed for handling, with access from above; on the other hand, the openings 3, 4 are thus provided at such a level that a very large volume, even comprising the greatest width of the metering storage unit 1, is available for the filling. The recessed grips 30 are, moreover, as can be seen from Figure 2, preferably formed with a greater curvature 31 in the upper area and a flatter curvature 32, in the lower area, which even runs straight in cross section. In this way, it is possible to advantageously attain a certain scooping effect. Upon emergence from the washing liquor in the course of a rotating movement of the washing machine drum 7, washing liquor, which then flows into the interior of the metering storage unit 1, collects in the recessed grip 30. If this is not already completely filled with washing liquor, an advantageous rinsing-out effect is produced, with respect to the clothing-treatment agent found in the interior.

Thus, the metering storage unit 1 has, as a whole, additional effects, going beyond mere metering. By means of the detachable fastening of the metering storage unit 1 in a washing machine drum 7, it acts, as it were, as a rib additional to the ribs already provided in a washing machine drum. Moreover, there is an advantageous washing trickling effect through the openings 3, 4, 5, and 6, if the metering storage unit emerges from the washing liquor during the rotational movement of the

washing drum and comes into the overhead position, until it is then, once more, immersed in the washing liquor. By the detachable anchoring in the washing machine drum, it is possible to easily remove the metering storage unit 1, for filling, from the washing machine; nevertheless, the disturbing knocking known with loose metering storage units does not occur during the washing process. A fixing of the metering storage unit 1 against lateral shifting is carried out by means of pins 35.

As can be seen, particularly from Figure 6 also in cross-section, the recessed grips 30 can project beyond the rear grip area 37, and form a hollow 38 to hold or provide intermediate storage for the detergent/washing liquor. With the embodiment in accordance with Figures 5 and 6 and 7 and 8, it is correspondingly not necessary to provide for a front filling opening, formed on the front end of the metering storage unit. With the embodiment example according to Figures 7 and 8, the filling opening, however, is not provided in the area of the recessed grip, but rather a separate filling opening 6' is formed in the prolonged rear grip area 37. The recessed grips 30 are not continuous in the area of the filling opening 6'.

The metering storage unit according to Figures 3 and 4 is formed oval, in cross section. Moreover, this metering storage unit 1 is preferably formed from a soft-elastic, resilient plastic to attain a pumping effect in interaction with a washing pressure from moist clothes in the washing drum. As a whole, this metering storage unit 1, in accordance with Figures 3 and 4, is thus formed oval in the shape of a hose. The dissolving or diluting of the detergent is accelerated by the pumping effect.

With the embodiments according to Figures 5 to 8, it is particularly important that the upper wall of the metering storage unit 1, facing the washing machine interior, be formed, in cross section, wave-shaped as a whole, converging at an acute angle with the storage unit base 11 at 39. Laterally, the result from the total structure is, as it were, a scoop ladle, which carries along, scooping, washing liquor when the washing drum rotates, with the washing liquor then being able to run into the recessed troughs 30 or the hollows 38 and then to flow into the interior of the metering storage unit 1, and can also, however, trickle down through the rear grip area 37, flowing onto the clothes, if the metering storage unit 1 is located in the upper region of the circular movement, moving along with the washing drum 7.

Furthermore, with the embodiment according to Figure 5, it is important that the openings 3, 4, which are, preferably arranged staggered with respect to one another, be formed in the same way as described with reference to Figure 1, projecting into the lateral wall area 39. The swallowing capacity during filling and also the scooping capacity in the washing operation are thus advantageously high. The affixing possibilities in the embodiment examples according to Figures 5-8 are the same as described for the other embodiments.

As is indicated, particularly in Figure 11, for example, the openings 3 and 4 are formed staggered with respect to one another. This is advantageous for a complete throughflow and thus also, a complete discharge of the clothing-treatment liquid from the metering storage unit 1. Moreover, with the metering storage units 1, according to Figures 1, 2, 3, 4, 7, 8, 9, 10, and 12, openings 5 are formed in the roof 10. With a throughflow of the upper half of the rotating movement of the washing drum, the clothing-treatment agent or the concentrated washing liquor formed by the inflow of water can trickle or flow down onto the clothes through the openings 5, which can influence the washing process advantageously, as already mentioned.

The metering storage unit 1 has a front filling opening 6, which faces the removal opening 20 (see Figure 14) of the washing drum 7--in the installed state--placed at a distance from the metering storage unit base 11. The plane E of the filling opening 6 is inclined in such a way that the upper end 13 of the filling opening 6 is set back with respect to the lower end 12. The metering storage unit base 11 rises to the filling opening 6 in the shape of a funnel. This makes possible a good filling and flowing-in of the clothing-treatment agent into the metering storage unit 1. In favor of a larger filling volume, the front wall of the metering storage unit 1 can also be formed approximately vertical, however, and then merge into the metering storage unit base 11. It is essential that the lateral openings 3 and 4 be formed at a distance from the metering storage unit base 11. The filled-in clothing-treatment liquid can thus not run out before the beginning of the washing process. A filling level 14 of the clothing-treatment liquid is below the openings 3 and 4 and below the lower end 12 of the filling opening 6.

With the embodiment, according to Figure 10, a screw-type cap 15 is provided. The clothing-treatment liquid can hereby exit from the metering storage unit 1 only through the openings 3 and 4 during the washing process.

All total, it is preferable that the metering storage unit 1 be constructed in the form of a rib integrated into the washing drum 7. An advantageous influencing of the washing process can also be attained in this way--for example, by the related rolling-through of the clothes.

With regard to the fastening of the metering storage unit 1 in the washing drum 7, it is particularly preferred that magnetic elements 33 be located in the metering storage unit base 11; they are preferably incorporated directly, for example, via a spraying process, so that they are encapsulated by plastic. A negative interaction between the magnetic elements 33 and the washing liquor cannot occur. The magnetic elements 33 can, for example, be provided elongated. Contrary to the graphic representation, it is possible to provide only one magnetic element 33. With the washing machines found on the market, the washing machine drums 7 are generally constructed magnetically so that additional magnetic elements are not required; rather, in this way, the metering storage units 1 can be affixed, in a detachable manner, directly adhered in a washing drum 7. A lateral shift is prevented by pins 35, which engage with the perforations of the washing drum 7.

The affixing of the metering storage unit 1 in the washing drum 7 can be implemented, moreover, by a holder band 16, as is shown in Figure 10. The holder band 16 can be anchored by means of a latching hook 17 in holes 18 of the drum 7, wherein the holder band 16 is advantageously constructed elastically. With the embodiment example according to Figures 12 and 13, the metering storage unit 1 on the metering storage unit base 11 has outside latching nubs 18, which can be inserted into openings 18 of the washing drum 7 for the formation of an insertion connection.

Other alternative fastening possibilities of the metering storage unit 1 in the washing drum 7 are illustrated in Figures 15 to 18. In Figure 15, a metering storage unit 1 can be seen, in cross section, when installed in the washing machine drum 7. A fleece band 36 is affixed, on the outside, on the metering storage unit base 11, which band interacts with a holder band 21. The holder band 21 has an adhesive coating on the underside and can therefore be stuck in the washing machine drum 7. It has approximately the dimensions of the metering storage unit base 11. On the upper side, the holder band 21 has a Velcro surface. The fleece band 20 can interact with the holder band 21 via a Velcro fastener. The metering storage unit 1 can be removed from the washing machine drum, for example, for filling, and then be used again and is held by the Velcro fastener when in use.

As an alternative to the Velcro fastener, metal elements can also be placed in the fleece band 36 and the holder band 21, which interact with one another magnetically. To this end, it is not necessary that the fleece band 36 have a fluffy execution. It can thus be an otherwise smooth band. For example, a magnetic plate or a magnetic plastic or a magnetic textile.

The metal elements can also be integrated directly into the base 11 of the metering storage unit 1, for example, if it is a plastic molded article, can be shaped at the same time directly.

A magnetic fastening of the metering storage unit 1 in the washing drum 7, as is described in the different embodiments, is also particularly advantageous with regard to the installation. When inserting into and removing from the washing drum 7, damage to the washing drum 7 is not possible.

With the representation according to Figure 16, latching nubs 22 are formed on the metering storage unit base 11, on the outside, which can be inserted into pressure nub-like elements 23, which, in turn, are fastened on the holder band 21. After the removal of the metering storage unit 1, only the holding snap fastener parts 23 remain in the washing machine drum. The washing machine can therefore be operated without the metering storage unit, without danger to the clothes.

With embodiment according to Figure 17, track elements 24 or 25 are constructed on the holder band 21 and on the base 11 of the metering storage unit 1 (outside). For example, these can be designed interrupted, wherein the sections are opened in front and closed in back. The metering storage unit 1 can thus be used, shifted forwards in the washing machine drum, so that the individual track elements are in alignment with one another. It can then be shifted a bit backwards, wherein the track elements of the metering storage unit 1 are moved, for example, into the track elements formed on the holder band 21. For anchorage, latching knobs 26 can be formed on the metering

storage unit base 11 and the holder band 21, which are to be crossed over with pressure. A cross section through the track connection in the pushed-together state is depicted in Figure 18. It is clear that tracks 24 are formed on the outside of metering storage base 11, which tracks are moved into corresponding track-like holding grooves 25.

Moreover, it is particularly important that the metering storage unit base 11 be formed convexly rounded, according to Figures 1, 2, 5, 6, 7, 8, 15, and 18, in adaptation to the concave rounding of the washing machine drum 7. Even if a front-loading washing machine 2 is depicted in Figure 14, the use of the metering storage unit 1, described here, is not limited to such a washing machine. Likewise, a metering storage unit 1, described here, can also be used with a top-loading washing machine.

As already explained above, it is preferred that the side walls 8, 9 of the metering storage unit 1 enclose an angle  $\alpha$  greater than  $90^\circ$ ; this can, for example, be an angle of up to  $120^\circ$ . With regard to the dimensions of the metering storage unit 1, particularly with an embodiment in accordance with Figures 1 and 2, it is preferred that it have a height of approximately 35 to 40 mm, with a width of approximately 80 to 90 mm and a length or depth of 150 to 180 mm. Here, one must take into consideration that the depth of a normal washing machine drum is approximately 220 to 250 mm.

With regard to the material for the metering storage unit, various possibilities exist. For example, the metering storage unit can be made of polyethylene, polypropylene, tetrafluoroethylene, polyvinyl chloride, or polyester. It is essential that the metering storage unit withstand, undamaged, temperatures up to  $95^\circ\text{C}$ , since they are reached with a boiling washing scheme. Also, a production from glass fiber-reinforced plastic is possible.

The features of the invention disclosed in the preceding description, the drawings, and the claims can be of importance both individually as well as in any combination for the implementation of the invention.

### Claims

1. Metering storage unit to hold and release a clothing-treatment liquid in a washing machine and with openings for the release of the clothing-treatment agent, characterized in that the metering storage unit (1) is designed as an axial rib which can be inserted into the washing drum (7), with a length corresponding approximately to the depth of the washing drum (7).
2. Metering storage unit, in particular, according to Claim 1, characterized in that openings (3, 4) are constructed on opposite surfaces of the metering storage unit (1), as entry and exit openings for the throughflow of washing liquid during the washing process.
3. Metering storage unit, in particular according to one or more of the preceding claims, characterized in that the openings (3, 4) are constructed, staggered with respect to one another.

4. Metering storage unit, in particular, according to one or more of the preceding claims, characterized in that the openings (3, 4) are made in side walls (8, 9), which point in the circumferential direction of the washing drum (7).

5. Metering storage unit, in particular, according to one or more of the preceding claims, characterized in that a recessed grip (30), serving as a scoop ladle, is formed in the area of the openings (3, 4).

6. Metering storage unit, in particular, according to one or more of the preceding claims, characterized in that a recessed grip (30) projects (in cross section) beyond the rear grip area (37) and forms a hollow (38) for the holding or the intermediate storage of detergent/washing liquor.

7. Metering storage unit, in particular, according to one or several of the preceding claims, characterized in that the opposite surfaces, in a cross section, enclose an obtuse angle.

8. Metering storage unit, in particular, according to one or more of the preceding claims, characterized in that in a roof (10) of the metering storage unit 1, pointing radially inwards with respect to the washing drum (7), openings are formed (5).

9. Metering storage unit, in particular, according to one or more of the preceding claims, characterized in that the metering storage unit has a rounded storage unit base, adapted to the curvature of a washing machine drum, and a filling opening (6), facing the removal opening (20) of the washing drum (7) and set at a distance to the storage unit base (11).

10. Metering storage unit, in particular, according to one or more of the preceding claims, characterized in that the metering storage unit (1) is formed, in cross section, as an oval.

11. Metering storage unit, in particular, according to one or more of the preceding claims characterized in that the plane (E) of the filling opening (6) runs at an incline.

12. Metering storage unit, in particular, according to one or more of the preceding claims, characterized in that the upper wall of the metering storage unit (1), facing the washing machine interior, in cross section, is designed wave-shaped as a whole, converging at an acute angle with the metering storage unit base (11).

13. Metering storage unit, in particular, according to one or more of the preceding claims, characterized in that the metering storage unit base (11) rises, funnel-like, to the filling opening (11) [sic; (6)].

14. Metering storage unit, in particular, according to one or more of the preceding claims, characterized in the fact that the metering storage unit (1) is made of a soft-elastic, resilient plastic, to attain a pumping effect in interaction with a washing pressure.

15. Metering storage unit, in particular, according to one or more of the preceding claims, characterized in that the metering storage unit for the detachable fastening in a magnetic drum, has a magnetic element (33), introduced into the storage unit base (11).

16. Metering storage unit, in particular, according to one or more of the preceding claims, characterized in that the metering storage unit (1) can be affixed by means of a holder band (16), which can be latched into openings (18) of the washing drum (7).

17. Metering storage unit according to one or more of the preceding claims, characterized in that on the metering storage unit base (11), outside latching knobs (19) or pins (35) are shaped for insertion anchorage into openings (18) of the washing drum (7).

18. Metering storage unit according to one or more of the preceding claims, characterized in that the metering storage unit (1) can be joined by adhesion to a holder band (21), which can be stuck in the washing drum.

19. Metering storage unit according to one or more of the preceding claims, characterized in that the metering storage unit (1) can be joined, in a detachable manner, to the holder band (21) by a Velcro fastener.

20. Metering storage unit according to one or more of the preceding claims, characterized in that magnetically interacting metal elements are located in the holder band (21) and in the base (11) of the metering storage unit (1).

21. Metering storage unit according to one or more of the preceding claims, characterized in that interacting snap fasteners (23) are located in the holder band (21) and in the base (11) of the metering storage unit (1).

20. Metering storage unit according to one or more of the preceding claims, characterized in that interacting track elements (24/25) are located in the holder band (21) and in the base (11) of the metering storage unit (1).

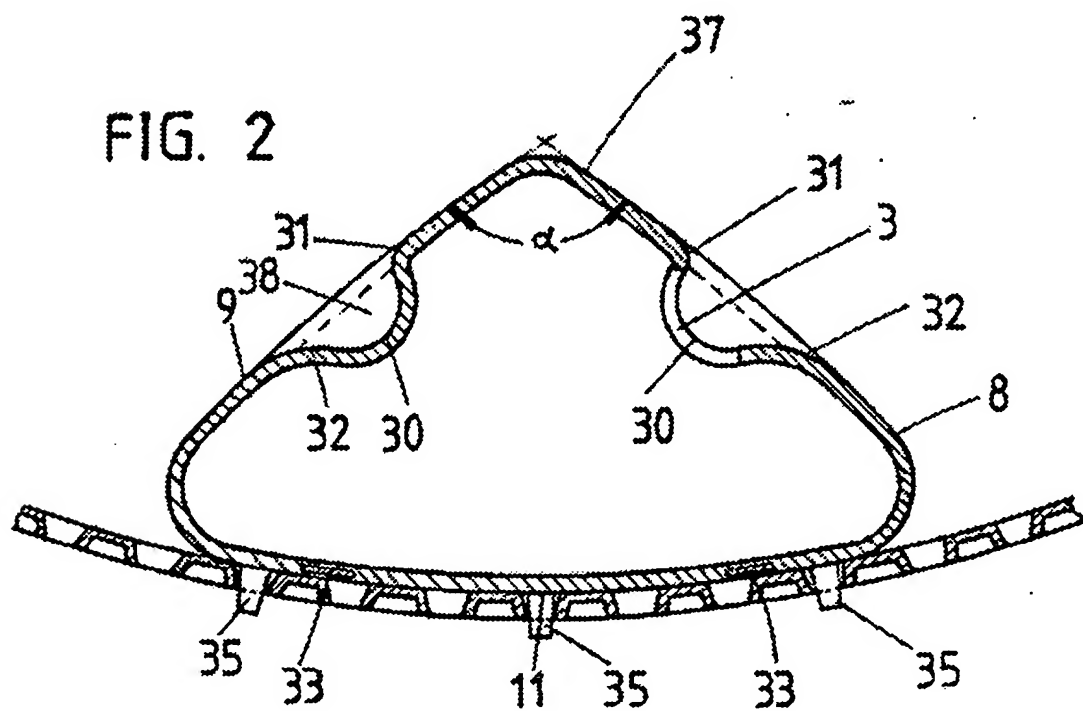
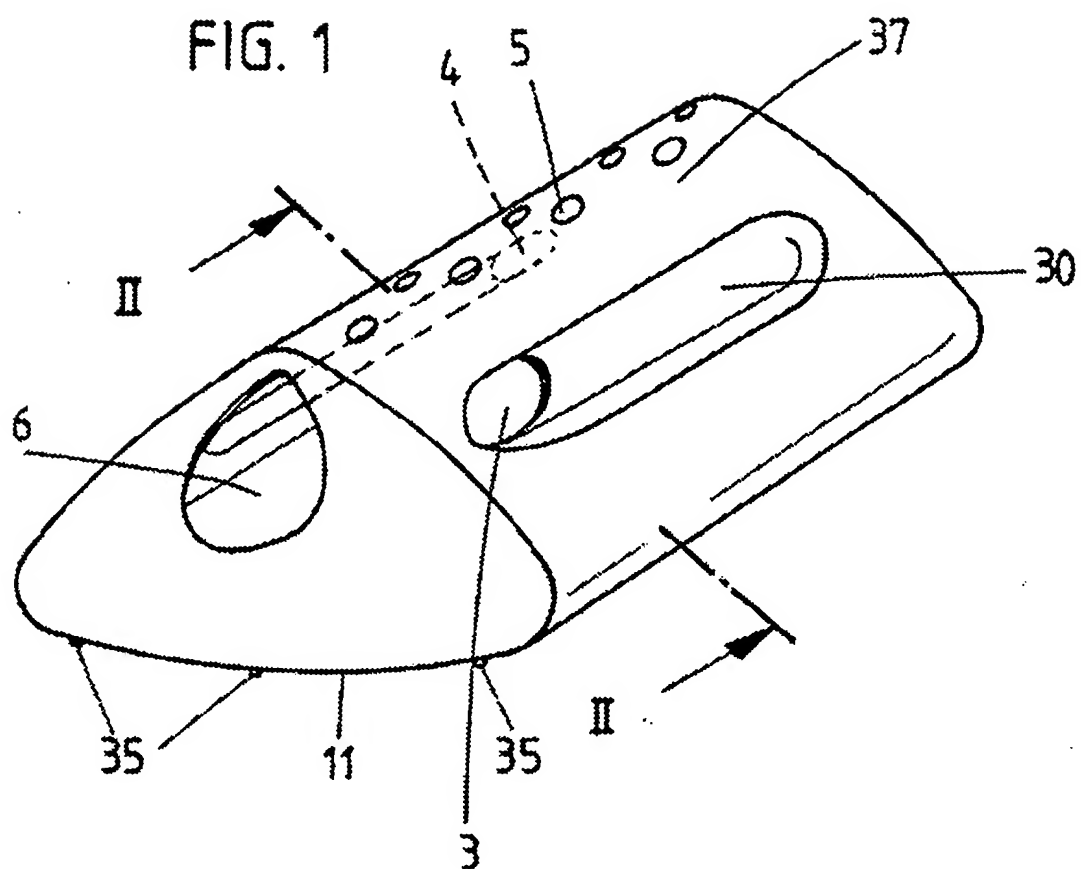




FIG. 3

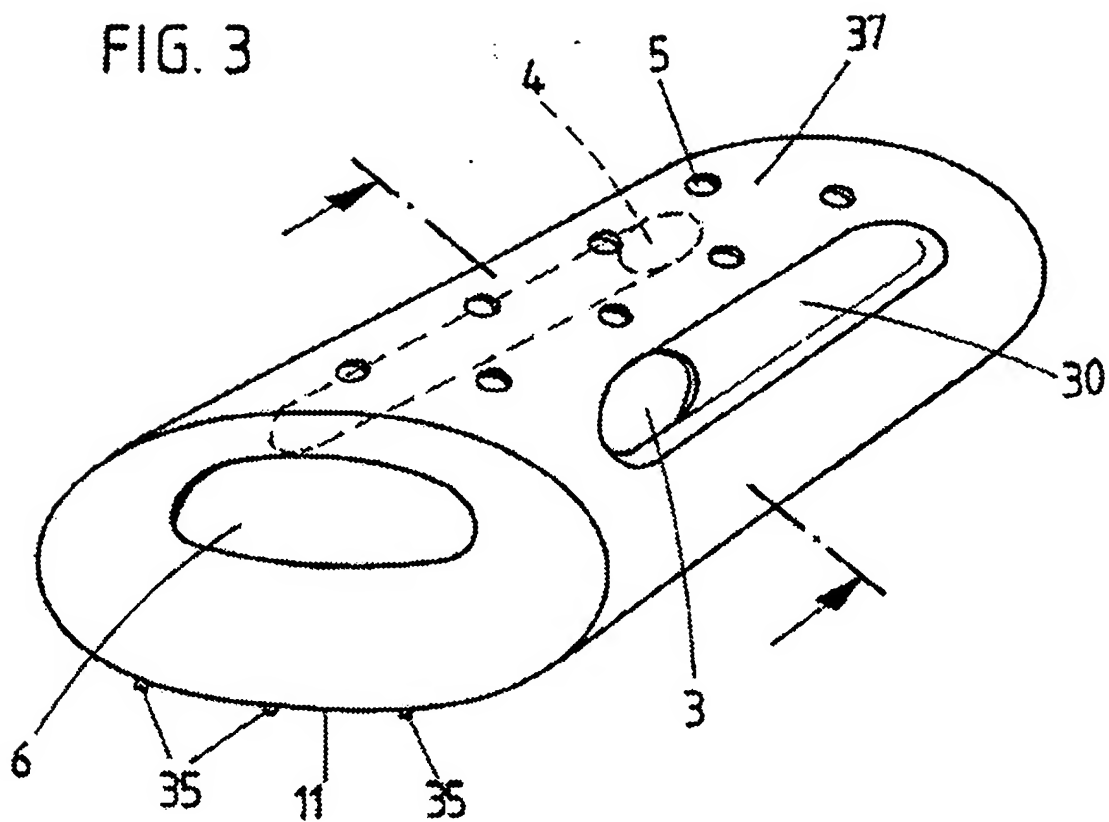


FIG. 4

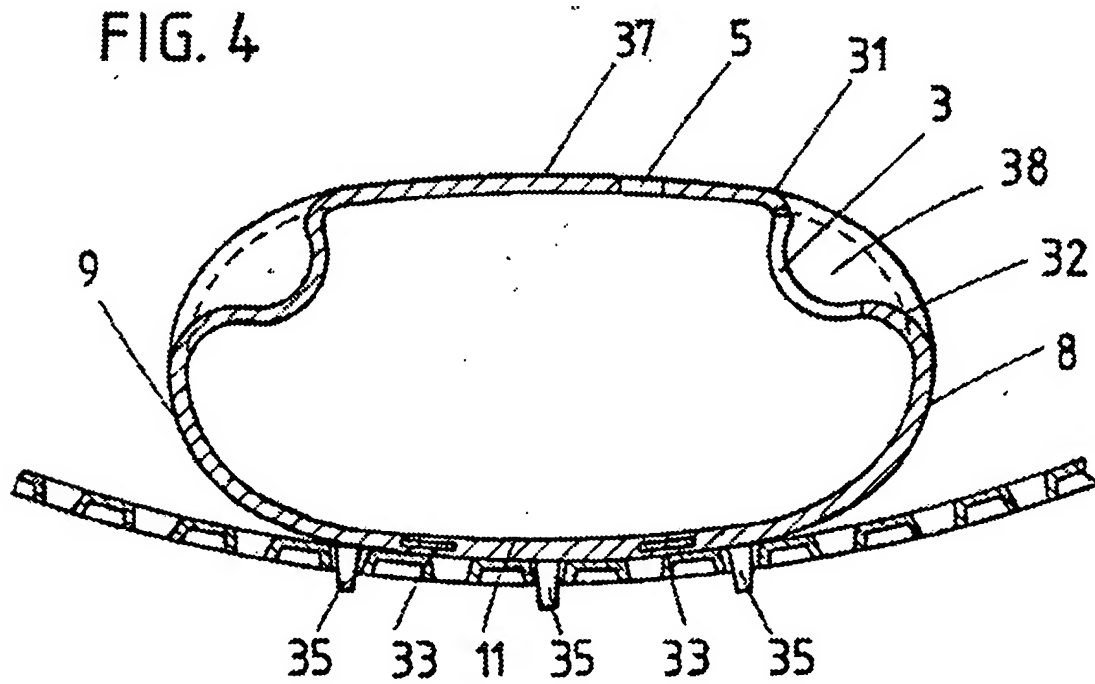


FIG. 5

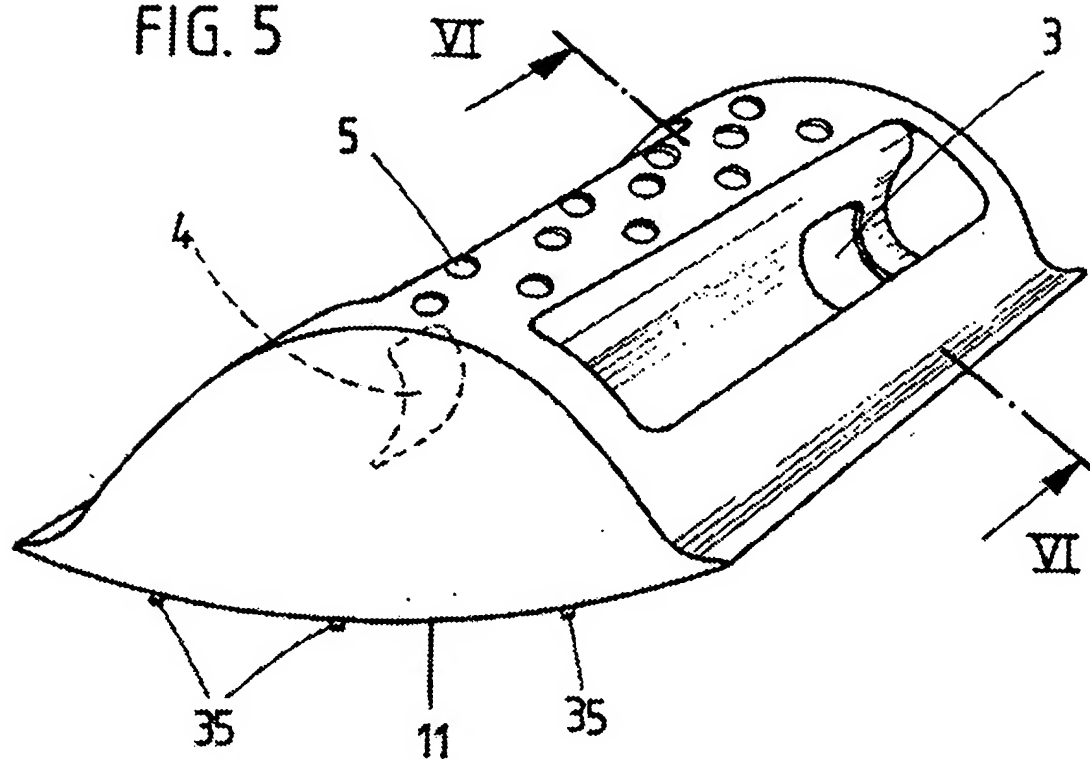
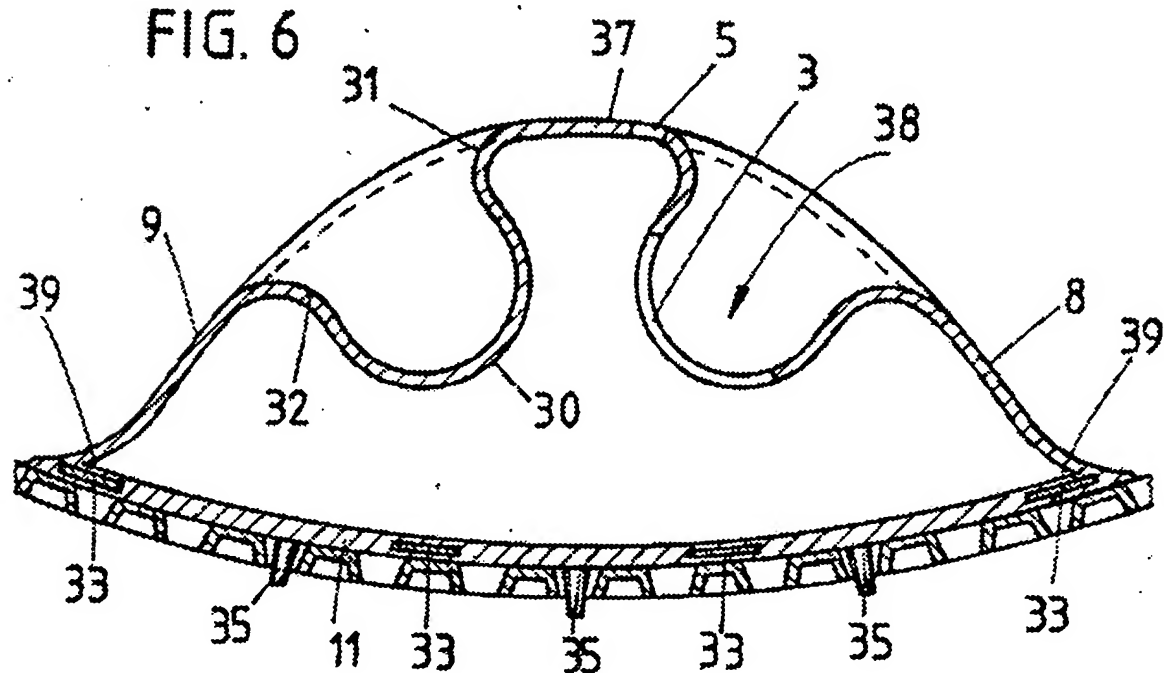


FIG. 6



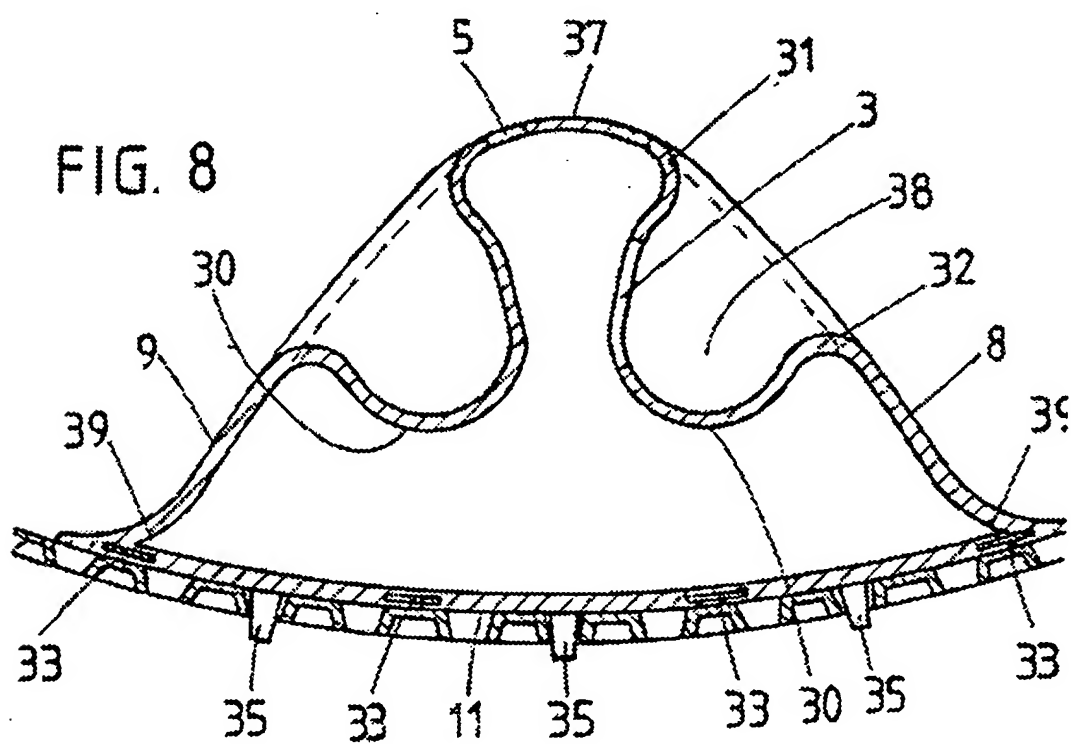
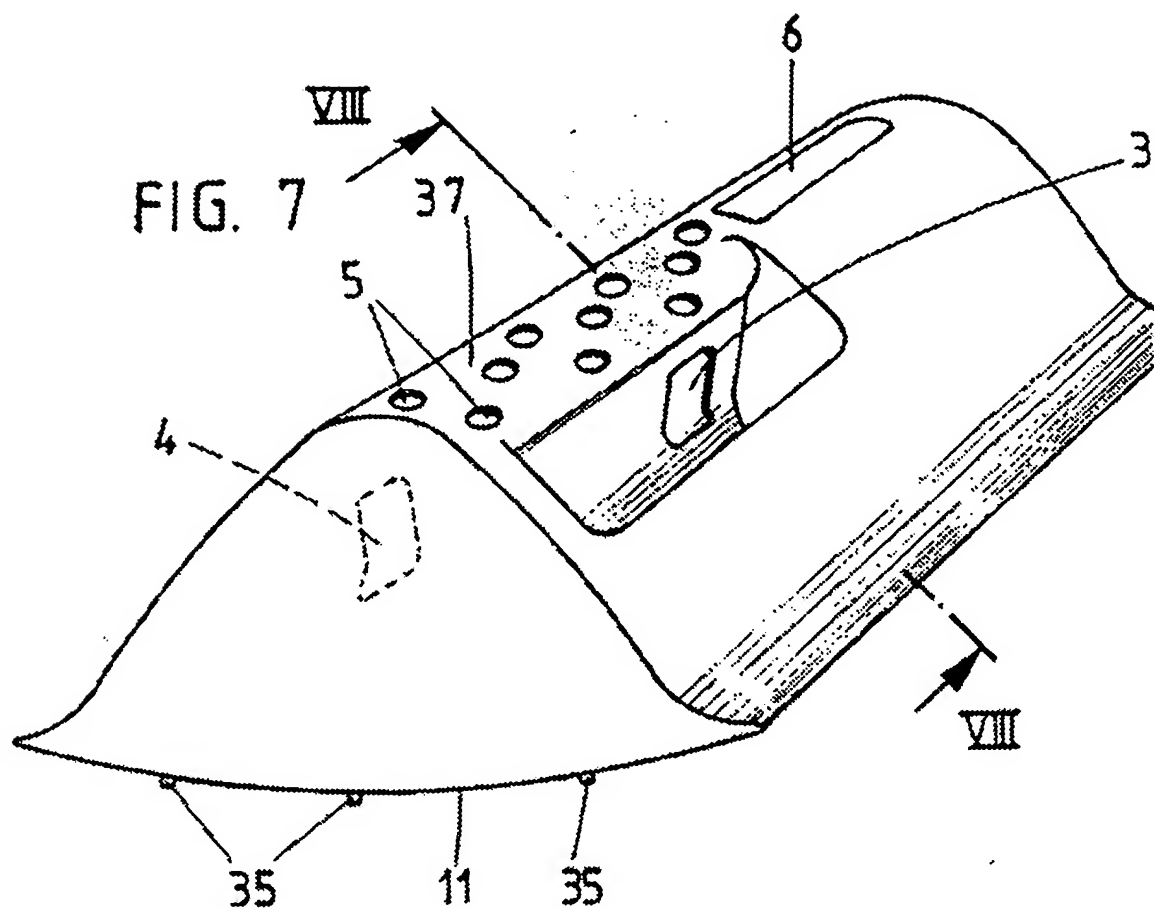


FIG. 9

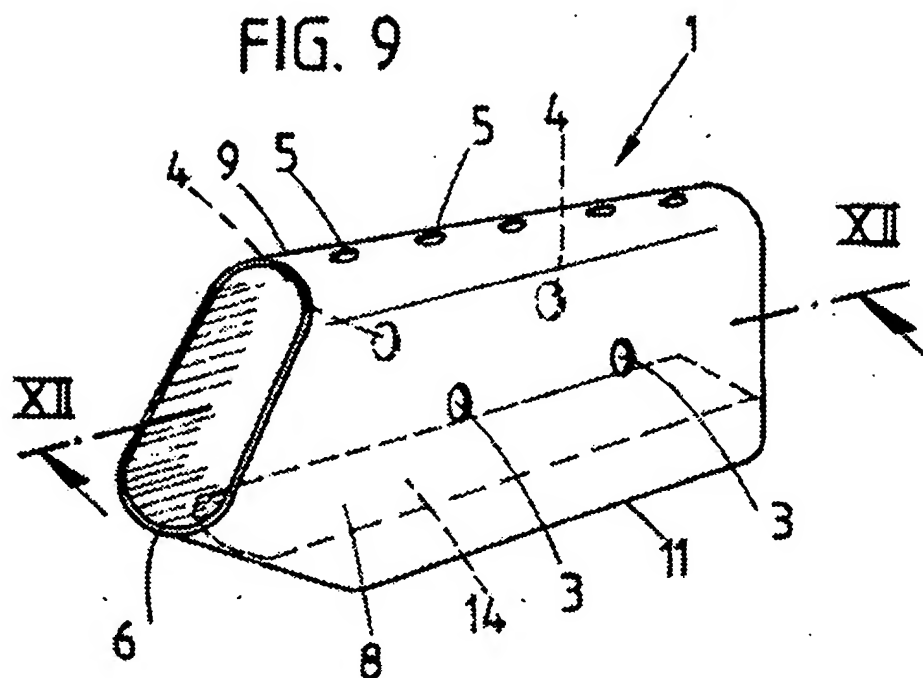


FIG. 10

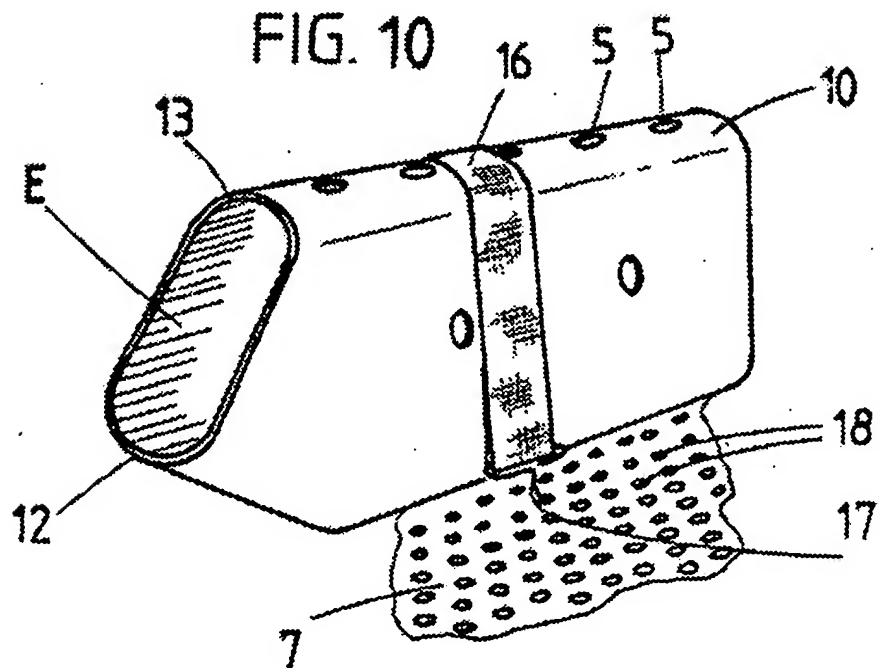


FIG. 11

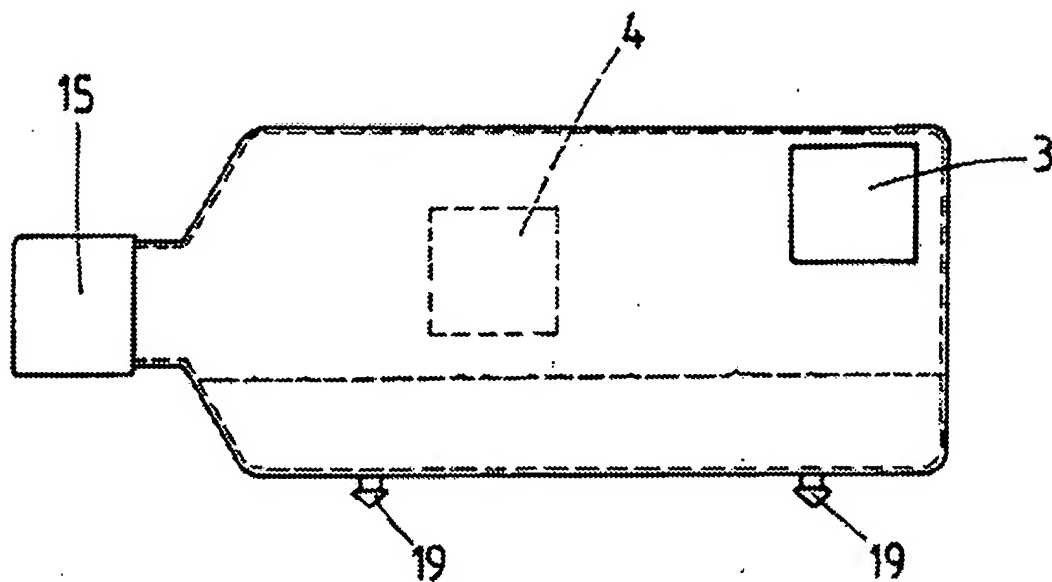


FIG. 12

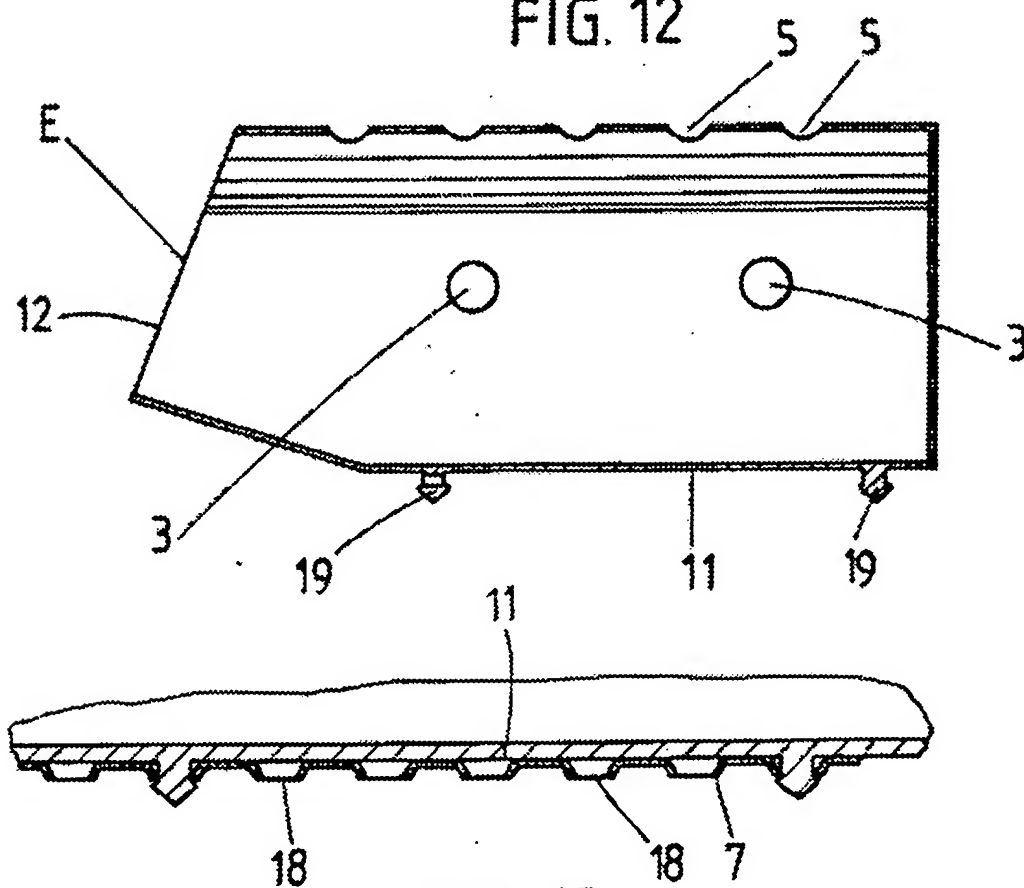


FIG. 13

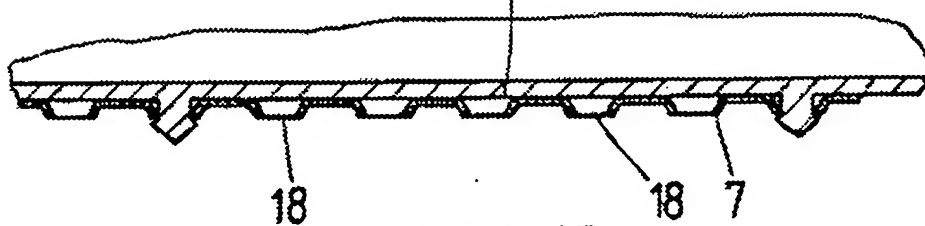


FIG. 14

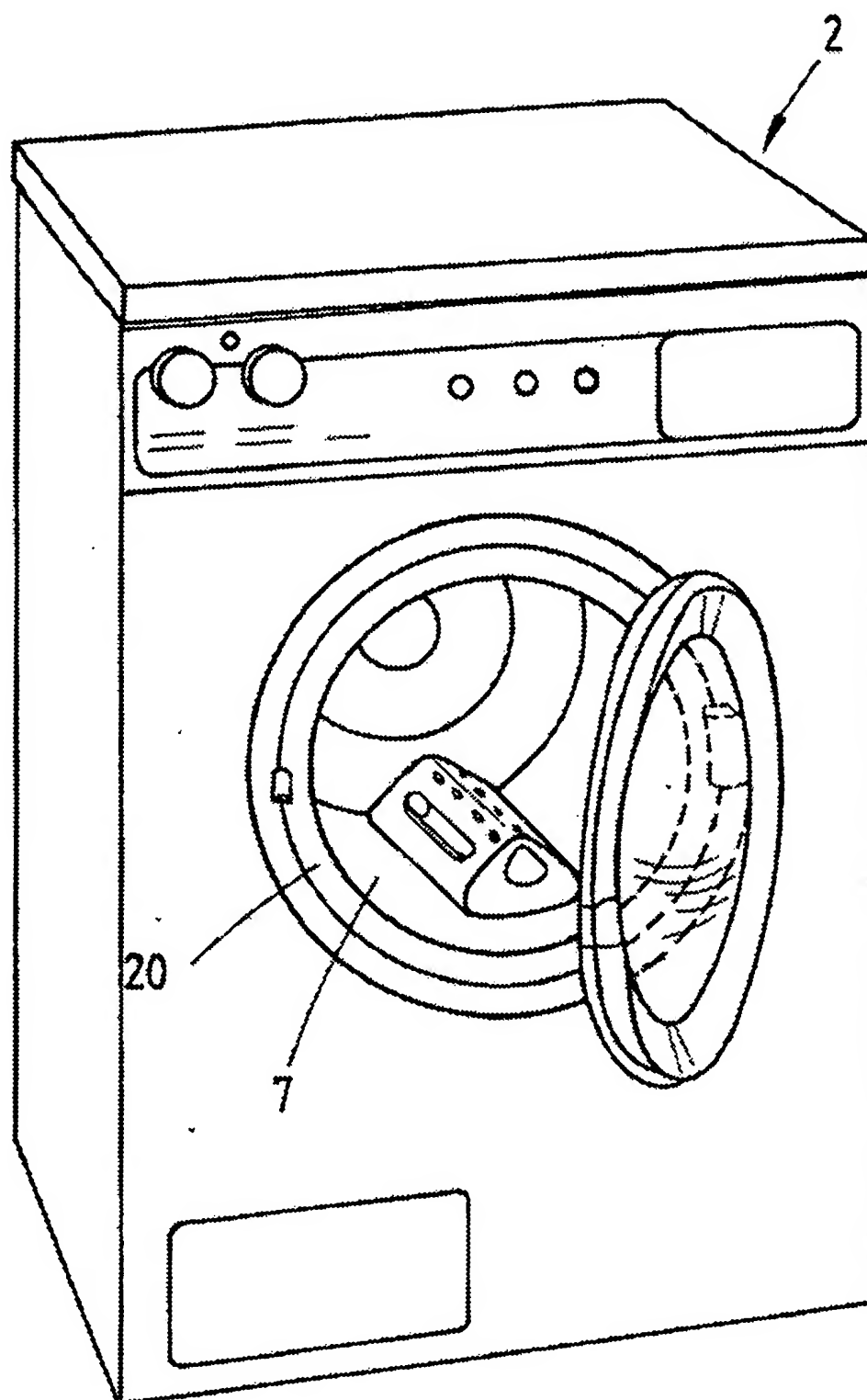
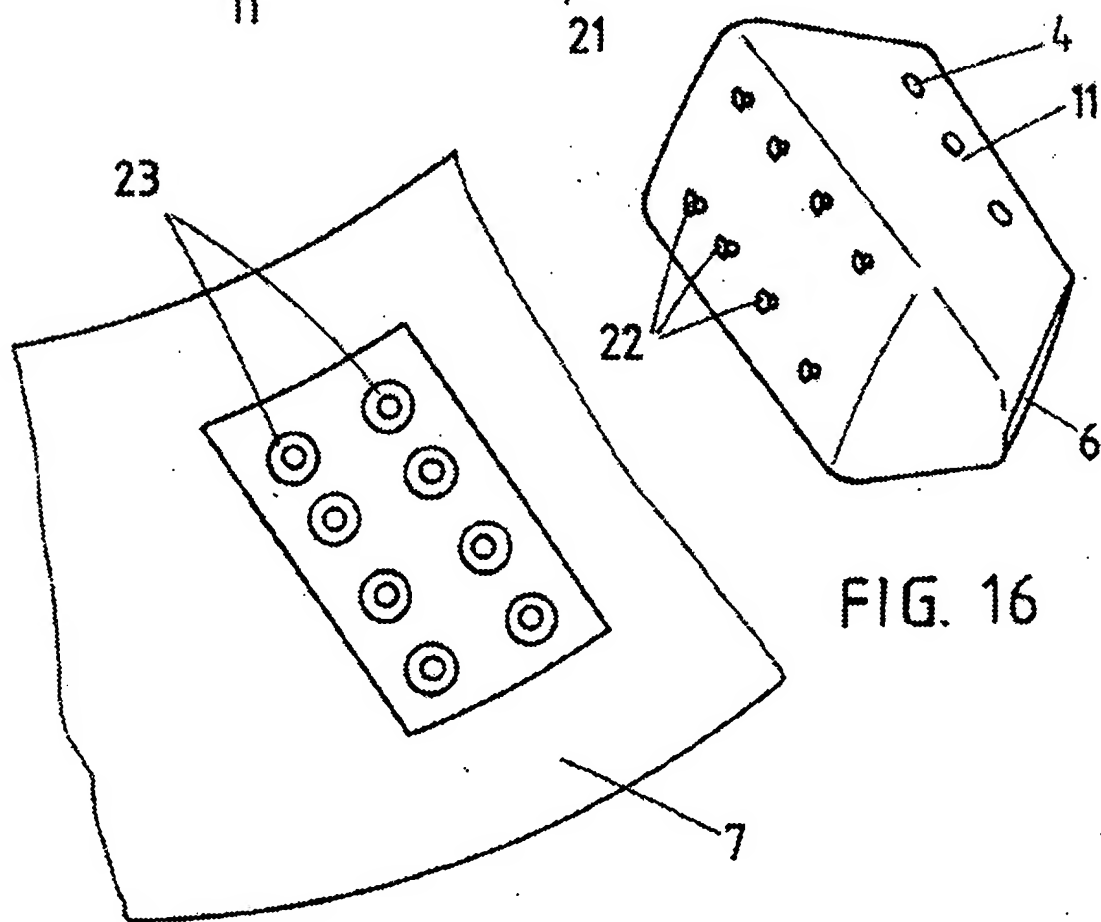
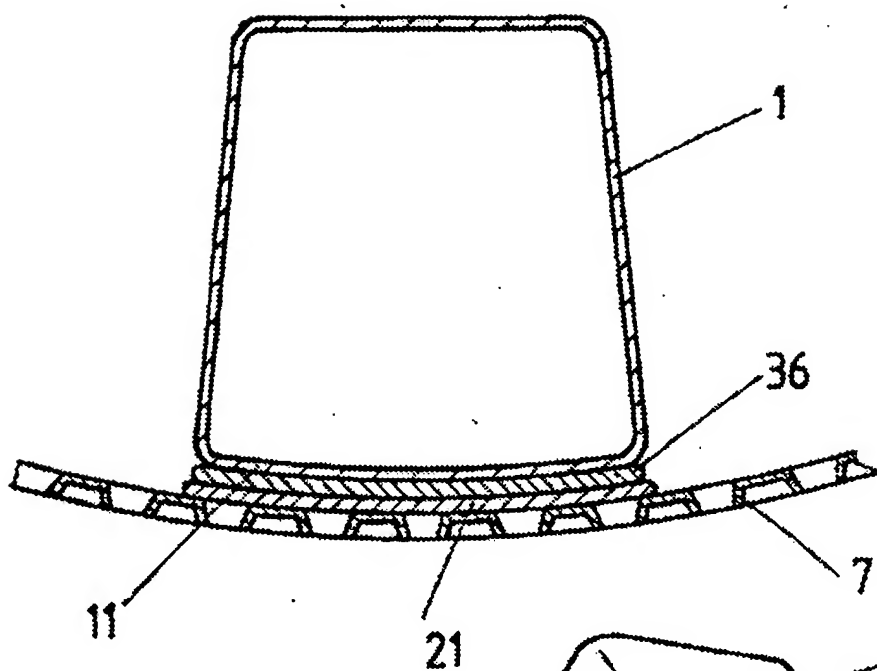


FIG. 15



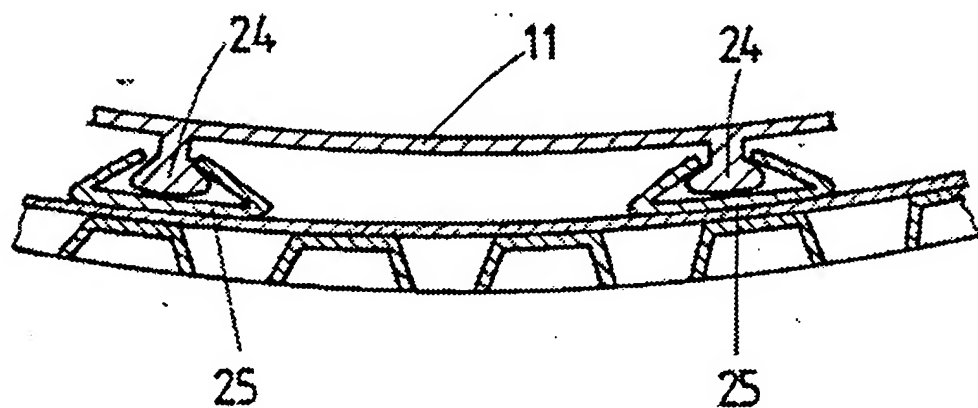
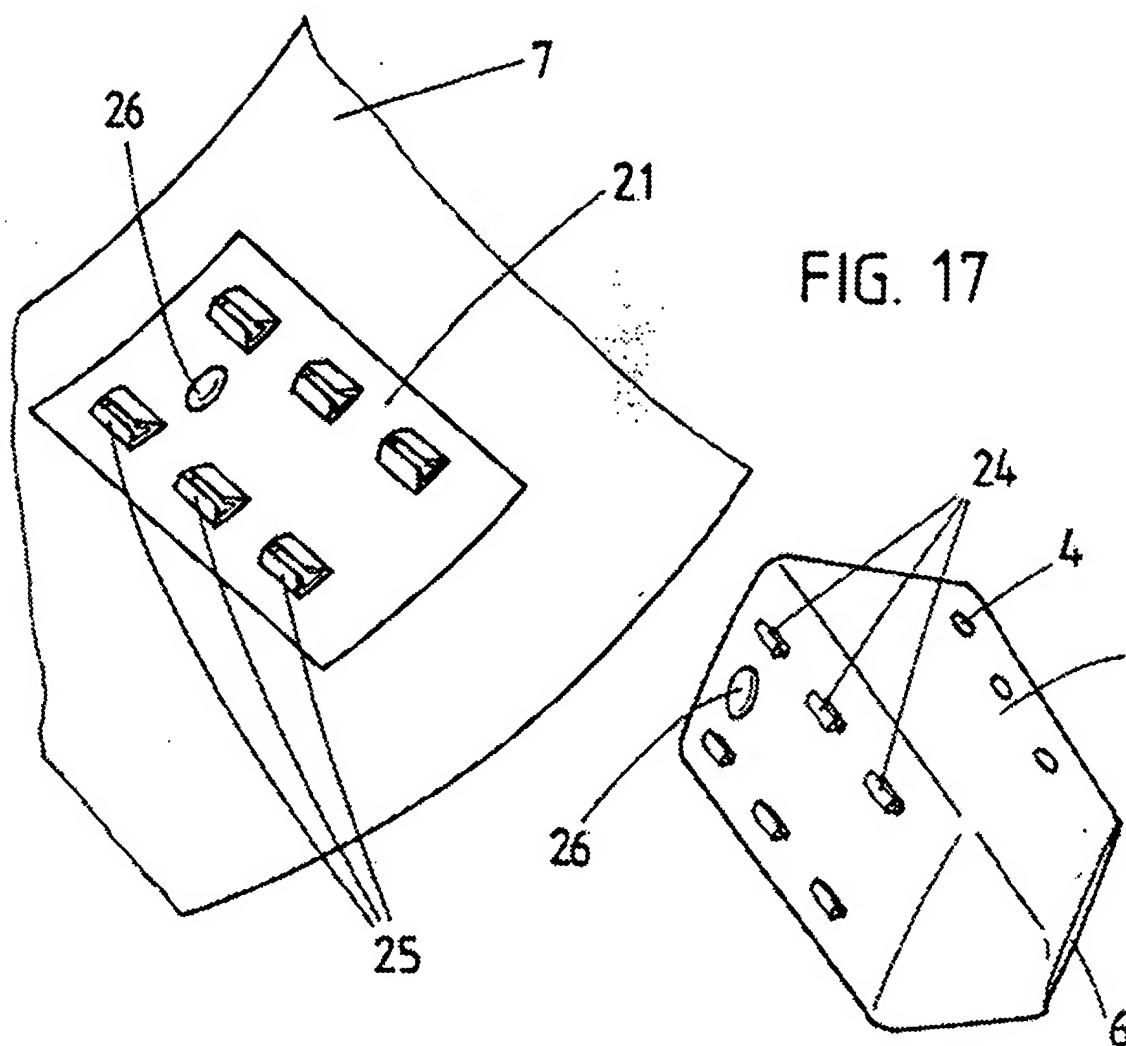


FIG. 18



European  
Patent Office

Application Number  
EP 89 11 2459

### EUROPEAN SEARCH REPORT

DOCUMENTS CONSIDERED TO BE RELEVANT															
Category	Citation of document with indication where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int Cl.5)												
A	US-A-3048993 (THE PROCTER & GAMBLE COMPANY) * Column 4, lines 24-70; Figure 11 *	1	D06F39/02 D06F23/02 D06F37/06												
A,D	US-A-3095722 (D.L. FOX) * Claim 1; Figure 1 *	1													
A	DE-C-486694 (H.L. KESSLER) * Claim 1, 2; Figure 1 *	1,2,4,5													
A	GB-A-1161219 (PHILIPS ELECTRONIC AND ASSOCIATED INDUSTRIES LIMITED) * Page 2, lines 18-52; Figure 4 *	1,17,20													
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)												
			D06F												
The present search report has been drawn up for all claims.															
Place of search THE HAGUE		Date of completion of the search OCTOBER 17, 1989	Examiner COURRIER G.L.A.												
<p align="center"><b>CATEGORY OF CITED DOCUMENTS</b></p> <table border="0"> <tr> <td>X: Particularly relevant if taken alone.</td> <td>T: Theory or principle underlying the invention.</td> </tr> <tr> <td>Y: Particularly relevant if combined with another document of the same category.</td> <td>E: Earlier patent document, but published on, or after the filing date.</td> </tr> <tr> <td>A: Technological background.</td> <td>D: Document cited in the application.</td> </tr> <tr> <td>O: Non-written disclosure.</td> <td>L: Document cited for other reasons.</td> </tr> <tr> <td>P: Intermediate document.</td> <td></td> </tr> <tr> <td></td> <td>&amp;: Member of the same patent family, corresponding document.</td> </tr> </table>				X: Particularly relevant if taken alone.	T: Theory or principle underlying the invention.	Y: Particularly relevant if combined with another document of the same category.	E: Earlier patent document, but published on, or after the filing date.	A: Technological background.	D: Document cited in the application.	O: Non-written disclosure.	L: Document cited for other reasons.	P: Intermediate document.			&: Member of the same patent family, corresponding document.
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